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Original Research Article

Nutritional knowledge, dietary behaviors and physical activity among undergraduate medical students: a cross-sectional study

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ABSTRACT

Background: Medical students undergo lifestyle transitions that may compromise healthy eating and exercise habits, potentially affecting their role as future health advocates. This study is done to assess nutritional knowledge, dietary behaviors, physical activity patterns, and body mass index (BMI) distribution among undergraduate medical students.
Methods: This cross-sectional study included 200 medical students (110 males, 90 females; aged 18-21 years) from Tertiary Hospital and Medical College of Navi Mumbai, India, surveyed from June-November 2023. A structured questionnaire assessed nutritional knowledge, meal patterns, food preferences, exercise frequency, and fast-food consumption motivations. BMI was calculated using WHO Asian population criteria.
Results: Mean age was 20.42±1.50 years with no significant gender difference. Adequate nutritional knowledge was reported by 79.5% of students (males 78.2%, females 81.1%, P=0.611). Daily exercise was practiced by 78.0% of participants, though 16.0% never exercised. Despite good knowledge, 52.5% preferred junk food over fruits/vegetables. Breakfast was regularly consumed by only 81.0% of students. BMI distribution showed 41.5% underweight, 37.0% normal weight, 13.5% overweight, and 8.0% obese. Social eating with friends (78.0%) was the predominant context, with group dining being the primary fast-food motivation (43.5%).
Conclusions: A significant knowledge-behavior gap exists among medical students regarding nutrition. Despite adequate knowledge and exercise habits, unhealthy food preferences and irregular meal patterns persist. Social influences strongly impact dietary choices. Comprehensive interventions addressing social and environmental factors, beyond traditional knowledge-based education, are needed to promote healthy behaviors among future healthcare providers.

Keywords: Medical students, Nutrition knowledge, Dietary behaviour, Physical activity, Body mass index, Cross-sectional study

INTRODUCTION

The transition to university life represents a critical period for establishing lifelong health behaviors, particularly regarding nutrition and the physical activity.[1] Medical students face unique challenges during this transition, as they must balance the intensive academic demands while preparing for their future role as healthcare providers and health advocates.[2] The World Health Organization emphasizes that adequate nutrition combined with regular physical activity forms the foundation of optimal health and disease prevention.[3] University environments often present barriers to maintaining healthy lifestyle behaviors. Students frequently experience significant changes in dietary patterns due to increased independence, time constraints, financial limitations, and social influences.[4,5]

These changes commonly manifest as increased consumption of processed foods, irregular meal timing, frequent breakfast skipping, and reduced intake of fruits and vegetables.[6,7]

Simultaneously, physical activity levels may decline due to sedentary study habits and reduced structured exercise opportunities.[8] Medical students represent a particularly important population for lifestyle behavior research. As future healthcare providers, their personal health behaviors may influence their credibility and effectiveness in promoting healthy lifestyles to patients.[9,10]

Furthermore, the demanding nature of medical education creates additional stressors that may negatively impact dietary and exercise patterns.[11] Previous studies have identified concerning patterns among medical students globally, including high rates of unhealthy food consumption despite adequate nutritional knowledge.[12,13] This knowledge-behavior gap presents significant implications for both individual student health and their future effectiveness as health promoters. In the Indian context, medical students face additional cultural and environmental factors that may influence their health behaviors.

The present study aims to comprehensively evaluate nutritional knowledge, dietary practices, and physical activity patterns among undergraduate medical students in Mumbai, India, to inform targeted interventions for this critical population.

Study objectives

The primary objective was to assess nutritional knowledge, dietary behaviors, and exercise habits among undergraduate medical students. Secondary objectives included evaluating meal consumption patterns, determining BMI distribution using WHO Asian criteria, identifying motivations for fast food consumption, and examining gender differences in health-related behaviors.

METHODS

Study design and setting

This cross-sectional observational study was conducted at Tertiary Care Hospital and Medical College, Navi Mumbai, Maharashtra, India, from June to November 2023. The institution is a private medical college serving a diverse student population in the Mumbai metropolitan region.

Participants

Undergraduate medical students aged 18-21 years were eligible for inclusion. Exclusion criteria included students with clinically diagnosed chronic illnesses or those on prescribed medications that could affect nutritional status. A total of 200 students were recruited through convenience sampling.

Ethical considerations

The study protocol was approved by the Institutional Ethics Committee. All participants provided informed verbal consent after receiving detailed information about the study objectives and procedures. Participation was voluntary, and confidentiality was maintained throughout the study.

Data collection

Data were collected using a structured, self-administered questionnaire developed specifically for this study. The instrument comprised seven sections:

Demographic information: Age, gender, height, weight, academic year

Nutritional knowledge assessment: Self-reported awareness of nutritional principles and balanced diet concepts

Meal consumption patterns: Frequency and regularity of breakfast, lunch, and dinner

Food preferences: Preference for fruits/vegetables versus processed/junk foods

Physical activity assessment: Exercise frequency categorized as daily, weekly, or never

Social context: Preferred company when eating out (friends, family, alone)

Fast food consumption: Frequency and motivations for consuming fast food

Anthropometric measurements

BMI was calculated using the formula: weight (kg)/height (m)^2. Based on WHO recommendations for Asian populations, BMI categories were defined as: underweight (<18.5 kg/m^2), normal weight (18.5-23.0 kg/m^2), overweight (23.0-27.5 kg/m^2), and obese (≥27.5 kg/m^2).[14]

Statistical analysis

Statistical analysis was performed using SPSS version 21.0. Continuous variables were presented as mean±standard deviation, and categorical variables as frequencies and percentages. Gender comparisons were conducted using independent t-tests for continuous variables and chi-square tests for categorical variables. Statistical significance was set at $P<0.05$.

RESULTS

Participant characteristics

The study included 200 medical students with a mean age of 20.42±1.50 years. Males comprised 55% (n=110) and females 45% (n=90) of the sample. Baseline characteristics are presented in Table 1. Males were significantly heavier than females (P=0.001), though BMI values were similar between groups.

Meal consumption patterns

Regular meal consumption varied significantly across meal types (Table 2). While lunch and dinner were consumed regularly by 96.5% of students, only 81.0% reported regular breakfast consumption. Breakfast skipping was more prevalent among females (21.1%) compared to males (17.3%), though this difference was not statistically significant (P=0.524).

Nutritional knowledge and health behaviors

Despite high levels of self-reported nutritional knowledge (79.5%), a significant knowledge-behavior gap was evident (Table 3). While most students demonstrated awareness of nutrition principles, 52.5% preferred junk food over fruits and vegetables. Daily exercise was practiced by 78.0% of students, though 16.0% reported never exercising. A significant gender difference was observed in preferred eating context, with males more likely to eat out with friends (P=0.043).

Fast food consumption motivations

Social factors emerged as the primary driver of fast-food consumption (Table 4). Group/social eating was the most common motivation (43.5%), followed by taste preferences (29.5%) and facility unavailability (19.5%). Time constraints and lack of cooking skills were less significant factors.

Table 1: Baseline demographic and anthropometric characteristics.

Characteristic	Male (n=110)	Female (n=90)	Total (n=200)	P-value
Age, years	20.37 (1.48)	20.47 (1.52)	20.42 (1.50)	0.639
Height, inches	70.28 (5.50)	69.04 (5.86)	69.73 (5.68)	0.123
Weight, kg	63.53 (6.36)	60.32 (7.23)	62.07 (6.95)	0.001*
BMI, kg/m²	20.32 (4.01)	20.02 (4.13)	20.18 (4.06)	0.604

*Data presented as mean (SD). Statistically significant (p<0.05)

Table 2: Meal consumption patterns.

Variable	Male (n=110)	Female (n=90)	Total (n=200)	P-value
Breakfast consumption				0.524
Regular	91 (82.7)	71 (78.9)	162 (81.0)	
Irregular/skip	19 (17.3)	19 (21.1)	38 (19.0)	
Lunch consumption				0.371
Regular	105 (95.5)	88 (97.8)	193 (96.5)	
Irregular/skip	5 (4.5)	2 (2.2)	7 (3.5)	
Dinner consumption				0.891
Regular	106 (96.4)	87 (96.7)	193 (96.5)	
Irregular/skip	4 (3.6)	3 (3.3)	7 (3.5)	

Data presented as n (%)

Table 3: Nutritional knowledge and health-related behaviors.

Variable	Male (n=110)	Female (n=90)	Total (n=200)	P value
Nutritional knowledge				0.611
Adequate	86 (78.2)	73 (81.1)	159 (79.5)	
Inadequate	24 (21.8)	17 (18.9)	41 (20.5)	
Exercise frequency				0.158
Daily	89 (80.9)	67 (74.4)	156 (78.0)	
Weekly	7 (6.4)	5 (5.6)	12 (6.0)	
Never	14 (12.7)	18 (20.0)	32 (16.0)	
Food preference				0.153
Fruits/vegetables	47 (42.7)	47 (52.2)	94 (47.0)	

Continued.

Variable	Male (n=110)	Female (n=90)	Total (n=200)	P value
Junk food	63 (57.3)	42 (46.7)	105 (52.5)	
Preferred eating context				0.043*
With friends	91 (82.7)	65 (72.2)	156 (78.0)	
With family	13 (11.8)	19 (21.1)	32 (16.0)	
Alone	6 (5.5)	6 (6.7)	12 (6.0)	

*Data presented as n (%). Statistically significant (p<0.05)

Table 4: Motivations for fast food consumption.

Motivation	Male (n=110)	Female (n=90)	Total (n=200)	P value
Mess/canteen closed	21 (19.1)	18 (20.0)	39 (19.5)	0.889
Taste preference	32 (29.1)	27 (30.0)	59 (29.5)	0.897
Social/group eating	50 (45.5)	37 (41.1)	87 (43.5)	0.568
Time constraints	5 (4.5)	4 (4.4)	9 (4.5)	0.971
Lack of cooking skills	2 (1.8)	4 (4.4)	6 (3.0)	0.245

Data presented as n (%)

Table 5: Body mass index distribution using who Asian criteria.

BMI category	Male (n=110)	Female (n=90)	Total (n=200)	P value
Underweight (<18.5 kg/m²)	41 (37.3)	42 (46.7)	83 (41.5)	0.032*
Normal weight (18.5-23.0 kg/m²)	48 (43.6)	26 (28.9)	74 (37.0)	
Overweight (23.0-27.5 kg/m²)	11 (10.0)	16 (17.8)	27 (13.5)	
Obese (≥27.5 kg/m²)	10 (9.1)	6 (6.7)	16 (8.0)	

*Data presented as n (%). Statistically significant (p<0.05)

BMI distribution

BMI distribution revealed concerning patterns (Table 5). A substantial proportion of students (41.5%) were underweight, with females more affected than males (46.7% vs 37.3%, P=0.032). Only 37.0% had normal BMI, while 21.5% were overweight or obese combined.

DISCUSSION

Principal findings

This study identified a significant knowledge-behavior gap among medical students regarding nutrition and dietary practices. While 79.5% reported adequate nutritional knowledge, concerning behavioral patterns persisted, including preference for junk food (52.5%), breakfast skipping (19.0%), and high prevalence of underweight status (41.5%). Social influences, particularly group eating with peers, emerged as primary drivers of unhealthy food choices.

Knowledge-behaviour paradox

The observation that medical students possess good theoretical knowledge but engage in suboptimal dietary behaviors aligns with previous research.[15,16] Several factors may contribute to this paradox. First, social influences appear paramount, with 78% preferring to eat out with friends and 43.5% citing group eating as the primary motivation for fast food consumption. This suggests that peer influence often overrides individual knowledge and preferences. Second, the university environment may present structural barriers to healthy eating. Despite adequate knowledge, students may choose convenient options due to time constraints, limited healthy food availability, or financial considerations. The finding that facility closure accounts for 19.5% of fast-food consumption supports this hypothesis. Third, the transition to independent living may create gaps between theoretical knowledge and practical implementation. Many students may lack practical cooking skills or meal planning experience, despite understanding nutritional principles.

Physical activity patterns

The finding that 78% of students engage in daily physical activity is encouraging and superior to many university populations globally.[17,18] However, the 16% who never exercise represent a significant at-risk population. The higher prevalence of physical inactivity among females (20% vs 12.7%) is consistent with global patterns and may reflect cultural, social, or infrastructural barriers specific to the Indian context.[19]

BMI distribution and nutritional status

The BMI distribution revealed a complex nutritional landscape characterized by a "double burden" of malnutrition. The high prevalence of underweight

individuals (41.5%) is particularly concerning and may indicate:

Inadequate caloric intake due to irregular meal patterns or food insecurity

Possible underlying health issues or eating disorders

Academic stress affecting appetite and eating behaviors

Cultural factors influencing body weight preferences

The higher underweight prevalence among females (46.7% vs 37.3%) may reflect societal pressures regarding body image or gender-specific dietary behaviours. Simultaneously, the emergence of overweight and obesity (21.5% combined) indicates early signs of lifestyle-related weight gain, possibly due to increased consumption of energy-dense processed foods and sedentary study habits.

Social determinants of food choice

The strong preference for eating out with friends (78%) and the identification of social eating as the primary motivation for fast food consumption highlight the crucial role of social context in dietary behavior. This finding has important implications for intervention design:

Peer influence may be more powerful than individual knowledge in determining food choices

Group-based interventions may be more effective than individual counseling

Environmental modifications in social dining contexts could have broad population impact

Gender differences

Several notable gender differences emerged, including males' stronger preference for social eating with friends and females' higher rates of underweight status. These differences may reflect biological, psychological, and sociocultural factors that should be considered in targeted interventions.

Clinical and public health implications

These findings have significant implications for medical education and public health practice:

Medical education reform: Traditional nutrition education appears insufficient for promoting healthy behaviors among medical students. Curricula should incorporate:

Practical nutrition skills including meal planning and cooking

Behavioral change techniques and self-efficacy building

Social and environmental approaches to health promotion

Campus environment: Universities should consider environmental modifications to support healthy choices:

Improved availability of healthy foods in social dining areas

Extended breakfast service hours to accommodate student schedules

Peer-led healthy eating initiatives

Future healthcare providers: Addressing lifestyle behaviours in medical students may improve their effectiveness as health promoters and role models for patients.

Study limitations

Several limitations should be acknowledged. The cross-sectional design precludes causal inferences. Self-reported data may be subject to social desirability bias. The single-institution setting may limit generalizability. BMI does not capture body composition or nutritional status comprehensively. The convenience sampling method may not represent all medical students.

Future research directions

Future studies should consider longitudinal designs to track behavioral changes throughout medical education. Intervention studies targeting social and environmental factors are needed. Qualitative research could provide deeper insights into barriers and facilitators of healthy behaviors. Multi-institutional studies would improve generalizability.

CONCLUSION

This study revealed a significant knowledge-behavior gap among medical students regarding nutrition and dietary practices. Despite adequate nutritional knowledge and regular exercise habits, concerning patterns persist, including junk food preferences, meal irregularities, and high underweight prevalence. Social influences, particularly peer dining contexts, strongly impact food choices.

These findings suggest that traditional knowledge-based nutrition education is insufficient for promoting healthy behaviors among future healthcare providers. Comprehensive interventions addressing social and environmental factors, beyond individual knowledge transfer, are needed. Such approaches should leverage peer influence positively, improve campus food environments, and provide practical skills for implementing healthy behaviors.

Given medical students' future role as health promoters, addressing their personal health behaviors has implications extending beyond individual wellness to their effectiveness in promoting population health. Bridging the knowledge-behavior gap identified in this study is crucial for developing healthcare professionals who can effectively advocate for healthy lifestyles through both their counsel and their example.

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REFERENCES

1. Nelson MC, Story M, Larson NI, Neumark-Sztainer D, Lytle LA. Emerging adulthood and college-aged youth: an overlooked age for weight-related behavior change. Obesity. 2008;16(10):2205-11.
2. Peltzer K, Pengpid S, Samuels TA, Özcan NK, Mantilla C, Rahamefy OH, et al. Prevalence of overweight/obesity and its associated factors among university students from 22 countries. Int J Environ Res Public Health. 2014;11(7):7425-41.
3. World Health Organization. Diet, nutrition and the prevention of chronic diseases. World Health Organ Tech Rep Ser. 2003;916(8):1-49.
4. Yahia N, Achkar A, Abdallah A, Rizk S. Eating habits and obesity among Lebanese university students. Nutr J. 2008;7:32.
5. Al-Rethaiaa AS, Fahmy AE, Al-Shwaiyat NM. Obesity and eating habits among college students in Saudi Arabia: a cross-sectional study. Nutr J. 2010;9:39.
6. Sakamaki R, Toyama K, Amamoto R, Liu CJ, Shinfuku N. Nutritional knowledge, food habits and health attitude of Chinese university students. Nutr J. 2005;4:4.
7. Chourdakis M, Tzellos T, Papazisis G, Toulis K, Kouvelas D. Eating habits, health attitudes and obesity indices among medical students in northern Greece. Appetite. 2010;55(3):722-5.
8. Keating XD, Guan J, Piñero JC, Bridges DM. A meta-analysis of college students' physical activity behaviors. J Am Coll Health. 2005;54(2):116-25.
9. Frank E, Breyan J, Elon L. Physician disclosure of healthy personal behaviors improves credibility and ability to motivate. Arch Fam Med. 2000;9(3):287-90.
10. Oberg EB, Frank E. Physicians' health practices strongly influence patient health practices. J R Coll Physicians Edinb. 2009;39(4):290-1.
11. Dyrbye LN, Thomas MR, Shanafelt TD. Systematic review of depression, anxiety, and other indicators of psychological distress among U.S. and Canadian medical students. Acad Med. 2006;81(4):354-73.
12. Amruth M, Kumar A. A cross-sectional study on BMI and eating habits among students in a medical college in Kerala. Int J Community Med Public Health. 2019;6(3):1285-94.
13. Vibhute NA, Baad R, Belgaumi U, Kadashetti V, Bommanavar S, Kamate W. Dietary habits amongst medical students: an institution-based study. J Family Med Prim Care. 2018;7(6):1464-6.
14. WHO Expert Consultation. Appropriate body-mass index for Asian populations and its implications for policy and intervention strategies. Lancet. 2004;363(9403):157-63.
15. Kolasa KM, Rickett K. Barriers to providing nutrition counseling cited by physicians: a survey of primary care practitioners. Nutr Clin Pract. 2010;25(5):502-9.
16. Spencer EH, Frank E, Elon LK, Hertzberg VS, Serdula MK, Galuska DA. Predictors of nutrition counselling behaviours and attitudes in US medical students. Am J Clin Nutr. 2006;84(3):655-62.
17. Haase A, Steptoe A, Sallis JF, Wardle J. Leisure-time physical activity in university students from 23 countries: associations with health beliefs, risk awareness, and national economic development. Prev Med. 2004;39(1):182-90.
18. Aceijas C, Waldhäusl S, Lambert N, Cassar S, Bello-Corassa R. Determinants of health-related lifestyles among university students. Perspect Public Health. 2017;137(4):227-36.
19. Pratt M, Macera CA, Sallis JF, O'Donnell M, Frank LD. Economic interventions to promote physical activity: application of the SLOTH model. Am J Prev Med. 2004;27(3):136-45.

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